The cycle spectrum of a graph $G$ is the set of lengths of cycles in $G$. Let $s(G)$ denote the size of the cycle spectrum of $G$. We show that if $G$ is a graph with a spanning cycle and $p$ chords, then $s(G) \geq \sqrt{p} - \frac{1}{2} \ln p - 2$. The result is asymptotically sharp when $G$ is the complete bipartite graph $K_{n,n}$ and $p = n^2 - 2n$, since then $s(G) = \sqrt{p} + 1$. (Received August 02, 2011)